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## Two New Polychaetes of the Families Pilargidae and Capitellidae from the Gulf of Mexico

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### INTRODUCTION

A number of polychaetous annelids new to science were encountered in the course of a biological survey of parts of the northern coast of the Gulf of Mexico in Florida. Of these, the first two to be reported upon are described below.

In addition to the species descriptions, discussions of the known genera of the Pilargidae and of those species of the capitellid genus *Scyphoproctus* that have been described previously are included, as well as keys to the pilargid genera and the species of *Scyphoproctus*.

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## FAMILY PILARGIDAE ST. JOSEPH

According to Hartman (1959), the family Pilargidae is presently comprised of six valid genera: *Pilargis* St. Joseph, *Ancistrostylis* McIntosh, *Loandalia* Monro, *Otopsis* Ditlevsen, *Talehsapia* Fauvel, and *Cabira* Webster. Of these, *Talehsapia* and *Cabira* are monotypic, and specimens of these genera have not been reported since their initial collection.

The family is a loose-knit group of which the unifying characters are a relatively small prostomium, an apodous peristomium, reduced notopodia, and the possession of only simple setae. Indeed, the various genera are sufficiently dissimilar that a cursory inspection by an investigator unfamiliar with the group might suggest that he was dealing with members of different families. Of the four best-known genera, *Pilargis*, *Ancistrostylis*, *Loandalia*, and *Otopsis* (with four, 11, three, and one species, respectively), *Pilargis* is best diagnosed by its flattened body, globular proboscis, reduced notopodia, which possess only embedded acicula, and only two prostomial antennae. *Ancistrostylis* is characterized by a cylindrical proboscis, notopodia that bear emergent acicular spines as well as notocicula, and three prostomial antennae. *Loandalia* possesses a cylindrical proboscis, projecting notocicula which are accompanied by fascicles of capillary setae, and an anal plaque, and it lacks antennae on its reduced prostomium. *Otopsis* also exhibits a reduced prostomium (Ditlevsen, 1917, and Uschakov, 1955), but here there are three prostomial antennae, and the achaetous notopodia are supported by embedded acicula.

On July 27, 1959, Lamarr B. Trott collected specimens of a pilargid from the sandy-silt bottom of Alligator Harbor, a barrier-spit lagoon in Franklin County, Florida. As is shown below, these show affinities to *Pilargis*, *Ancistrostylis*, and *Cabira*, and, in addition, exhibit a number of unique characters. They are considered to represent a new genus of the Pilargidae.

## GENUS ANCISTARGIS, NEW GENUS

TYPE: *Ancistargis papillosus*, new species.

At present this genus, which has the characters of the only known species,<sup>1</sup> is represented by an ovigerous holotype of 45 setigers measuring 10.0 mm. in length and about 0.5 mm. at its widest, including parapodia; an ovigerous paratype of 54 setigers, 8.1 mm.; and a second para-

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<sup>1</sup> Since this paper was written, Kitamori (1960) has described *Pilargis matsunagaensis*, new species, from Matsunaga Bay, Hiroshima Prefecture, Japan, which, from its description, appears to be referable to the genus *Ancistargis*.

type, non-ovigerous, consisting of an anterior fragment of 22 setigers which measures 4.2 mm.

The prostomium bears two antennae and appears to be fused to the peristomium. The proboscis is globular and sac-like, with a muscular core which extends to the distal margin of the proboscis. Dorsal cirri are present from the first setiger, and ventral cirri from the third setiger. Notopodia are provided with embedded acicula which terminate distally in the base of the dorsal cirri, and, from the third setiger, there are notopodial hooks which emerge from the body just medial to the dorsal cirri. Neuropodial setae are of three kinds: simple, unornamented, non-limbate, capillary setae; shorter, simple setae which are provided with a double row of relatively long teeth on the cutting edge; and a second type of short, simple seta, the denticulation of which is a more subtle, fine crenulation.

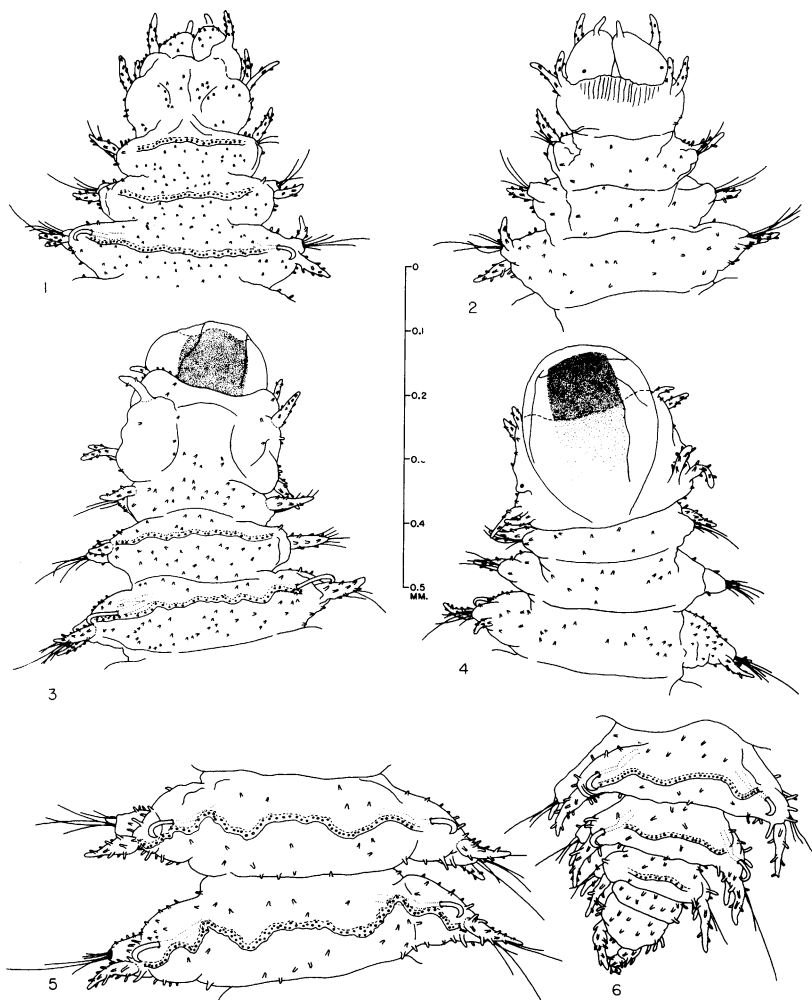
*Ancistargis* differs from all other pilargids in respect to setal types and may be considered to be intermediate between *Ancistrostylis* McIntosh and *Cabira* Webster, on the one hand (on the basis of emergent notopodial hooks), and *Pilargis* St. Joseph, on the other (general morphology and the presence of only two prostomial antennae). These affinities account for the selection of the generic name (*Ancist-rostylis* and *Pil-argis*).

### ***Ancistargis papillosus*, new species**

Figures 1-14

The peristomium (figs. 1 and 2) of *Ancistargis papillosus* is a complete ring bearing two pairs of cirri which are inserted ventrolaterally. The prostomium appears bilobed dorsally, with a rather flat mid-region. It is fused to the peristomium and extends forward dorsally as a flap overlying the oral area. Two antennae are inserted near the anterior edge of the prostomium, and there is no trace of a median unpaired antenna. The large paired palpi arise from the anterolateral surface of the prostomium, and each bears a filiform palpostyle at its tip. A pair of eyespots are situated near the base of the palpi on the ventral surface. When the proboscis is withdrawn, the palpi appear to be quite separate from each other; however, when the proboscis is everted (fig. 3), it is apparent that there is a membrane connecting them, under which the proboscis moves. Dorsally, the palpi, the prostomium, and the peristomium are strewn with papillae; the dorsum of the rest of the body is more densely ornamented with similar papillae. Ventrally, there are fewer papillae on the general body surface, and the head region is almost devoid of them (fig. 4).

The proboscis consists of a thin, globular sac which bears neither



FIGS. 1-6. *Ancistargis papillosus*, new genus and new species. 1. Dorsal view of anterior end of holotype. 2. Ventral view of anterior end of holotype. 3. Dorsal view of anterior end of a paratype, with proboscis everted. 4. Ventral view of anterior end of a paratype, with proboscis everted. 5. Dorsal view of two setigers from mid-region of holotype. 6. Dorsal view of pygidial region of holotype.

teeth nor papillae (figs. 3 and 4). A muscular extension of the gut projects forward to the distal margin. Ventrally, the proboscis merges into the ventral surface of the peristomium (fig. 4), and, dorsally, its extrusion separates the paired palpi and reveals the connecting membrane men-

tioned above. It also separates the lobes of the prostomium perceptibly and moves the peristomial cirri somewhat posteriorly.

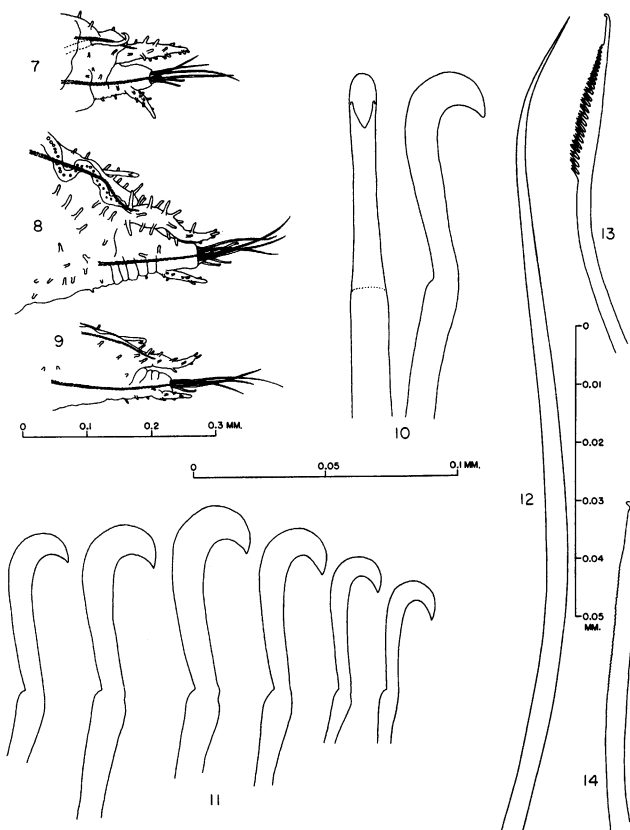
Both dorsal and ventral cirri of the parapodia (figs. 1, 2, and 7) are provided with papillae similar to those that are found along the length of the body. Both are fusiform to attenuated fusiform in shape, and the ventral cirri are from one-half to two-thirds of the length of the dorsal. The dorsal cirri begin at the first setiger and extend the length of the body, while the ventral cirri are present on the third and all successive setigers. Both cirri are inserted on the posterior surface of the parapodia. The dorsal cirri reach their maximum size in the mid-region of the body, and the ventral cirri are of approximately the same size throughout.

The parapodia are sub-biramous, in that only the neuropodial lobes are well developed (figs. 7-9), and the notopodia are reduced to a dorsal cirrus, a notoaciculum, and a single (or, rarely, two; fig. 3) emergent, acicular seta. The neuropodial lobes are attenuated laterally and are supported by nearly straight embedded acicula. The latter extend to the extreme tips of the ventral lobes, which are retractile to some extent. Notoacacula run parallel to the dorsal body surface and, in the parapodia of the mid-region, undergo a gentle sigmoid curvature near their tips before they terminate in the basal area of the dorsal cirri (figs. 7-9). The acicular setae emerge from the dorsal surface of the parapodia at approximately one-half of the parapodial length and are oriented nearly parallel to the frontal plane of the animal. The setal bundles are not arranged in obvious transverse series or in whorls. They are confined to the tips of the neuropodial lobes, with one type of seta posterior, and the other two types anterior, to the aciculum (see below).

For the most part, the papillae of the dorsal surface are more concentrated in the anterior region, just posterior to the peristomium (fig. 1). The papillae are present throughout the rest of the body but are fewer in number.

Beginning with the first or second setiger, transverse ridges are evident on the dorsum. These extend from the base of one dorsal cirrus to the base of the other (figs. 3, 5, and 6). The ridges are bowed posteriorly on each side of the center line and are provided with many close-set vacuoles. These vacuoles selectively take up rose bengal, a general protein stain.

The body of *A. papillosus* terminates in a pygidial segment which bears a pair of anal cirri (fig. 6). The next-to-last segment is achaetous and apodous, and the segment preceding this is the last to bear setae and both dorsal and ventral cirri. The third-to-last segment is the last



FIGS. 7-14. *Ancistargis papillosus*, new genus and new species. 7. Posterior view of fifth right parapodium of a paratype. 8. Posterior view of twenty-seventh right parapodium of a paratype. 9. Posterior view of fiftieth right parapodium of a paratype. 10. Posterior and dorsal views of hooks from a paratype, from the twenty-seventh and fifteenth setigers, respectively. 11. Dorsal views of hooks of holotypes, from right setigers (from left to right) 3, 15, 30, 42, 43, and 44. 12. Non-limbate capillary seta from setiger 27 of a paratype. 13. Denticulate seta from setiger 50 of a paratype. 14. Crenulated seta from setiger 27 of a paratype.

that carries dorsal acicular hooks. All the posterior cirri and segments are papillose; the anal cirri are densely papillose.

The emergent acicular setae (= notopodial hooks) of *Ancistargis papillosus* are reminiscent of those of several species of *Ancistrosyllis*, notably *A. bassi* Hartman and *A. cingulata* (Korschelt), as well as *Cabira incerta* Webster, in that they are large, recurved hooks (figs. 10 and 11). Approximately midway along the length of these setae there is an en-

largement on one side, somewhat reminiscent of the node of the hooded hooks of certain Capitellidae. These setae emerge from the dorsal surface of the parapodia at a point about halfway between the node and the distal curve of the hook. They are oriented with the plane of the curved portion parallel to the frontal plane of the animal, and with the recurved tips pointing posteriorly. These are first found on the third setiger and are present on all subsequent setigers, to and including the next-to-last. Their size remains fairly constant throughout the length of the animal, and only those of the last few setigers are somewhat smaller (fig. 11).

The neurosetae are all simple. The most common of the three types present is a very slender, non-limbate, capillary seta which bears neither teeth nor other type of ornamentation (fig. 12). These arise on the posterior face of the parapodial tips and are found on all setigers. The second type of seta is also distributed on all setigers, but the setae are fewer in number than the first type. These second setae are about one-third of the length of the first type and have a cutting edge comprised of two rows of relatively long teeth (fig. 13). The second row of teeth is visible only by careful focusing, using an oil-immersion objective; these appear to alternate with the teeth of the first row. The tip of this seta is a slightly recurved knob which is separated from the toothed area by a smooth region. Generally, this seta resembles the setae that Hartman (1947b) shows for *Pilargis berkeleyi* and *P. maculata*, except that a bifid tip is not present, and the present setae are approximately one-fourth of the size of those of *Pilargis*. They differ also in that two rows of teeth are present, rather than a single row. The third type of neuroseta is similar to the second type, but is somewhat more broad and is provided with a cutting edge which is more nearly crenulate than toothed (fig. 14). These have been observed only on neuropodia of the mid-region of the body. Both the second and third types of neuroseta arise from the anterior face of the parapodia.

In comparison with the six genera of Pilargidae previously known, *Ancistargis* is most readily separable on the following morphological grounds:

1. A pair of bi-articulated palpi [separated from *Talehsapia* and perhaps from *Cabira*, although the "sides of head produced into thin plates . . ." in *Cabira* (Webster, 1879, p. 267) may actually prove to be modified palpi].
2. A single pair of prostomial antennae (from *Ancistrostylis*, *Loandalia*, *Otopsis*, and *Talehsapia*).
3. Peristomium with two pairs of tentacular cirri (from *Loandalia* and *Talehsapia*).
4. A globular, sac-like proboscis (from *Ancistrostylis*, *Loandalia*, and *Talehsapia*).
5. First setiger with dorsal cirri (from *Loandalia*, *Otopsis*, and *Talehsapia*).

6. Pygidium with anal cirri, no anal plaque (from *Loandalia*).
7. Parapodia provided with heavy dorsal acicular setae (from *Pilargis*, *Loandalia*, *Otopsis*, and *Talehsapia*).
8. Three types of setae, as detailed above (from all six other genera).

The weakest of the distinctions listed above are those dealing with *Cabira* and *Pilargis*. Unfortunately, there is a strong possibility that Webster, in his description of *Cabira*, has confused dorsal and ventral in discussing parapodia, cirri, and acicular setae. This has been commented upon by Fauvel (1920) and Hartman (1947b), and the latter has gone so far as to suggest (p. 490) that this name might best be dropped from the literature. Webster (1879) does mention that there are "dorsal cirri on all segments; no ventral cirri" (p. 267). Thus, whether dorsal or ventral, there is only one series of parapodial cirri. In addition, Webster states that *Cabira* possesses capillary setae, apparently non-denticulate, although fine teeth might be overlooked in observations made with the lower powers of a microscope. These two features appear to suffice in separating *Cabira* and *Ancistargis*. However, *Cabira* is described as having "Ventral setae, stout hooks beginning on the 6th setigerous segment, one to each ramus." These are similar to the acicular setae of *Ancistargis* and some species of *Ancistrostylis* and thus would seem to ally these three genera.

Separation from *Pilargis* rests mainly on the presence of hooked acicular setae projecting from the notopodial area, as well as the variety of setal types; the prostomium and peristomium of *Pilargis* are well differentiated from each other and are poorly separated in *Ancistargis*; and the peristomium of *Pilargis* is dorsally incised, whereas that of *Ancistargis* is entire. In addition, there is a striking difference in size, for the four species of *Pilargis* attain a length of at least 90 mm. and have more than 300 segments, while ovigerous *Ancistargis* are 8 and 10 mm. in length for 54 and 45 setigers, respectively.

The following key to the genera of the Pilargidae is modified from that presented by Hartman (1947b, p. 490):

#### KEY TO THE GENERA OF THE PILARGIDAE

1. Prostomium with pair of thin, lateral plates with papillose surfaces; neuropodia with heavy recurved hooks . . . . . *Cabira* Webster
- Prostomium without such lateral plates; neuropodia without recurved hooks . . . . . 2
2. Prostomium with two antennae; peristomium with two pairs of cirri . . . . . 5
- Prostomium without antennae; peristomium without cirri . . . . . 4
- Prostomium with three antennae; peristomium with two pairs of cirri . . . . . 3
3. Notopodia with emergent acicular setae . . . . . *Ancistrostylis* McIntosh



- Notopodia without emergent acicular setae ..... *Otopsis* Ditlevsen
4. Prostomium with a pair of bi-articulated palpi ..... *Loandalia* Monro
- Prostomium without palpi ..... *Talehsapia* Fauvel
5. Neurosetae are capillaries and/or toothed, or smooth, simple falcigers that have bifid tips; notopodia represented only by embedded acicula; peristomium dorsally incised ..... *Pilargis* St. Joseph
- Neurosetae of three types: long capillaries; short falcigers with two rows of teeth and a blunt, slightly recurved tip; and short falcigers with a crenulated cutting edge; notopodia represented by large, stout, hooked acicular setae, as well as embedded acicula; peristomium dorsally entire ..... *Ancistargis*, new genus

The holotype and the paratypes of *Ancistargis papillosus* have been deposited in the American Museum of Natural History (holotype, A.M.N.H. No. 3601; paratypes, A.M.N.H. No. 3602).

The author is indebted to Mr. Lamarr B. Trott, now at the Department of Zoology of the University of Hawaii, for the specimens on which this description is based.

#### FAMILY CAPITELLIDAE GRUBE

There are only three described species of the capitellid genus *Scyphoproctus* Gravier. *Scyphoproctus djiboutiensis* Gravier is known from the Bay of Djibouti, on the Gulf of Aden (Gravier, 1904), the Red Sea (Gravier, 1906), and India (Fauvel, 1930, 1953); *S. gravierei* Okuda was described from a single posterior fragment comprised of the last seven setigers and pygidium, collected at Kakihana, Okinawa (Okuda, 1940); and *S. oculatus* Reish was taken in Newport Bay on the southern California coast (Reish, 1959). In addition, Treadwell (1902) described *Dasybranchus rectus* from Puerto Rico, and later (Treadwell, 1939) redesignated it *Scyphoproctus rectus* (Treadwell). The specimen on which Treadwell based his description was an anterior fragment which therefore lacked the anal plaque that characterizes the genus. This fact and the presence of "uncini" (hooded hooks?), which are not toothed (Treadwell, 1902, p. 207), cast doubt on the validity of this generic redesignation, as has been pointed out by Hartman (1947a, pp. 430-431).

On September 9, 1959, a series of grab samples and trawls were taken in 100 feet of water, on a sandy bottom, approximately 12 miles off the Florida coast at Panama City, Bay County (latitude 30° 00' 34'' N., longitude 85° 54' 12'' W.). From these collections, eight specimens of a new species of *Scyphoproctus* were obtained, of which seven were complete and one was a posterior fragment. Most of the individuals were found in an empty *Strombus* sp. shell, and one was observed to be inhabiting the vacated tube of a sabellariid polychaete.

GENUS *SCYPHOPROCTUS* GRAVIER, 1904**Scyphoproctus platyproctus**, new species

Figures 15-26

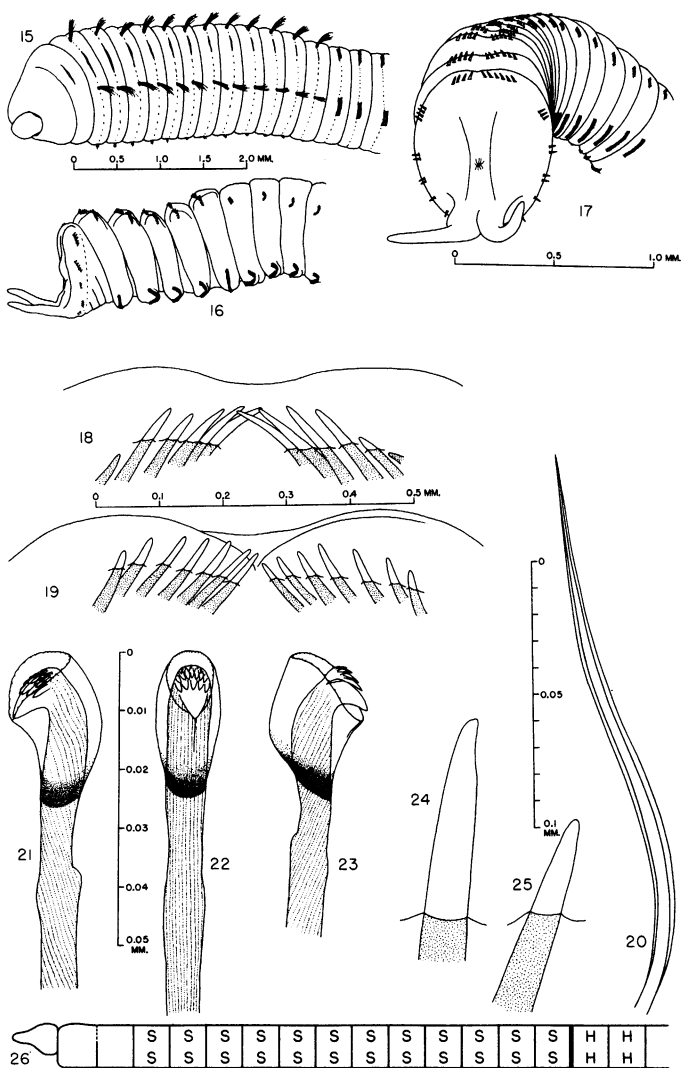
As stated above, eight specimens form the basis of this description of *S. platyproctus*. One specimen measures 25 mm. and has 63 setigerous segments. Others are 14 mm. (71 setigers), 19 mm. (64 setigers), 9 mm. (61 setigers), 16 mm. (60 setigers), 14 mm. (59 setigers), and 16 mm. (41 setigers). The posterior fragment measures 9 mm. and comprises the last 26 setigers. There is little variation in thickness along the length of the body, and smaller specimens are approximately 0.75 mm. in diameter, while larger animals are as much as 1.5 mm.

The 12 setigerous, bi-annulate segments of the thoracic region bear capillary setae in both the notopodial and neuropodial fascicles. These are inserted in the intrasegmental furrow, slightly posterior to the middle of the segment, and project from the body of the worm at almost right angles (fig. 15). In the two specimens of which the thoracic surface has been examined microscopically, there appear to be transversely oriented slits, widenings of the intrasegmental furrow, which may prove to be lateral organs.

The thorax and the abdomen can be consistently separated only on the basis of the change from bi-limbate capillary setae on the twelfth setiger to hooded hooks on the thirteenth. The segmental dimensions in this area show no great change between thorax and abdomen. The abdominal portion of the worm is comprised of segments that may vary in length from one to two times that of the thoracic segments. With the exception of the segments in the extreme posterior region, all abdominal segments are provided only with hooded hooks which arise in transverse series in the posterior part of each segment. The beaks of the neuropodial hooks point dorsally, while those of the notopodia point ventrally. No branchiae have been observed in any of the specimens examined.

The prostomium of all specimens was sufficiently withdrawn into a recess in the peristomium so that it was impossible to determine whether or not nuchal organs were present. There are no well-formed eyes, although there are series of sub-surface pigment spots which appear to be embedded in the supra-esophageal ganglion and are disposed as two crescents, one on each side. Between the achaetous peristomium and the first setiger there is an incomplete achaetous segment (fig. 15). Ventrally, this segment is well delimited from the peristomium, while dorsally there appears to be a fusion of the two.

In the posterior portion the notopodial fascicles of hooded hooks are



FIGS. 15-26. *Scyphoproctus platyproctus*, new species. 15. Ventrolateral view of thoracic region. 16. Lateral view of posterior end. 17. Posterior view of anal plaque area and posterior portion of abdomen. 18. Posterodorsal view of notopodial acicular setae of next-to-last abdominal segment (stippled area indicates embedded region). 19. Posterior view of dorsalmost groups of acicular setae of anal plaque. 20. Bi-limbate capillary seta from thorax. 21. Three-quarter view of hooded hook from fifty-third setiger. 22. Nearly full-face view of a hooded hook from fifty-third setiger. 23. Profile of a hooded hook from twenty-third setiger, showing separation of crest and fang. 24. Lateral view of a notopodial acicular seta from a second-to-last abdominal setiger. 25. Posterior view of a notopodial acicular seta from a next-to-last abdominal setiger. 26. Diagrammatic distribution of setae, according to the convention of Hartman (1947a).

replaced by transverse rows of heavy acicular setae which occur on the four to seven segments immediately anterior to the anal plaque (figs. 16 and 17). These setae are arranged dorsally on each segment, and paired groups are separated medially. There are from two to seven acicular setae in each group, and often several others can be seen beneath the body surface in cleared specimens (fig. 18). In general, there are fewer acicular setae on the more anterior segments than on those more proximal to the anal plaque. The most posterior segments are also distinguished by their moniliform appearance, as individual segments are separated by deep intersegmental furrows (fig. 16). In this region the neuropodial hooded hooks may be arranged in a horseshoe shape, with the open end of the horseshoe oriented posteriorly.

The pygidium of *Scyphoproctus platyproctus* is a flattened plaque (figs. 16 and 17), slightly oblique to a transverse plane. Groups of acicular setae, similar to those of the immediately preceding notopodia, are disposed around the margin of the plaque, in a transverse plane of the animal. Although there are what appear to be intersegmental furrows on the ventral surface, there are no neuropodial fascicles in this region. The number of acicular setae in a group is rather variable, ranging from one to seven; cleared preparations reveal more acicular setae beneath the body surface, but, in general, the number of emergent setae increases dorsally. There is further variation in the number of groups of acicular setae to be found around the periphery of the anal plaque; these range from five to seven. The anal opening is somewhat ventral to the center of the anal plaque, and, just below the anus, two anal cirri arise from the plaque surface.

As stated above, the setae of the thoracic region are all simple, bilimbate capillaries, which may show one or two gentle curves (fig. 20). The limbations originate basally at approximately the level of the body surface.

The hooded hooks (figs. 21–23), which are found only in the abdominal region, are generally similar to those presented by Hartman (1947a) for other Capitellidae. There are: a node which is more pronounced on one side than the other; a shaft, shoulder, and neck which are not markedly delimited; and a fang which may project beyond the opening of the hood. As in the case of those hooded hooks figured by Hartman (1947a, pls. 43–58), the fang is surmounted by a crest. In *S. platyproctus*, the crest is comprised of several rows of small teeth and is seen to be separated from the fang in those hooks that are appropriately oriented (fig. 23). There is no definite pattern of distribution of the smaller teeth of the crest, but the most common pattern (exhibited

in 38 of 63 neuropodial hooded hooks from various segments of a single worm) was one in which the row immediately above the fang was comprised of three large and two small teeth (fig. 27I and L). Of these 38 hooks, 17 were provided with a second row of seven still smaller teeth (fig. 27I). Only 13 notopodial hooded hooks were found appropriately oriented for critical observation, and, of these, seven bore a first row of

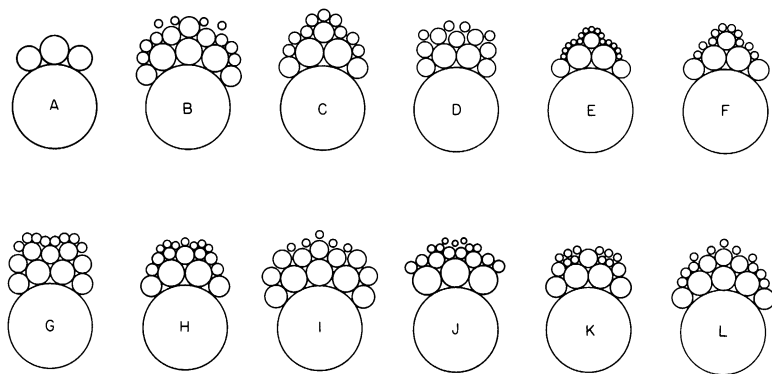


FIG. 27. Diagrammatic representation of distribution and relative size of teeth of hooded hooks. Because of difficulty in rendering true spatial relationships of these teeth in true perspective, fang and teeth of various sizes are presented conventionally by circles of various diameters. As a point of departure, one of Hartman's illustrations (1947a, pl. 43, fig. 2, *Capitella capitata*) has been redrawn (as A), to be comparable to the other drawings in this figure. A. Hooded hook of *Capitella capitata*. B-L. Hooded hooks of *Scyphoproctus platyproctus*, new species, showing variation in single specimen. B. Hook from nineteenth right notopodium. C. Hook from thirty-sixth right notopodium. D. Hook from forty-fourth right notopodium. E. Hook from forty-seventh right notopodium. F. Second hook from forty-seventh right notopodium (E and F were adjacent in the same fascicle). G. Hook from thirteenth left neuropodium (first abdominal setiger). H. Hook from twenty-ninth left neuropodium. I. Hook from thirty-first left neuropodium. J. Hook from forty-fourth left neuropodium. K. Hook from forty-seventh right neuropodium. L. Hook from fifty-sixth left neuropodium (last abdominal neuropodium).

two large and two small teeth (figs. 27C-F), and, in four of these, a second row was noted which was composed of a single tooth (fig. 27E and F). The third and fourth rows of both notopodial and neuropodial hooks showed very variable arrangement. All the observations related to the fine structure of the hooded hooks were carried out with the use of oil immersion. Observations made with dark-field and phase-contrast, oil-immersion microscopes gave the same results: there is no sin-

gle simple arrangement of the teeth of the crest of the hooded hooks of *Scyphoproctus platyproctus*. The aperture of the hood is quite wide, and in some cases may even approach a flared condition; the cleft of the hood extends to approximately one-half of the distance from the aperture to the insertion of the hood on the shaft. The margin of the hood is serrated for only part of its periphery.

The acicular setae of the posterior segments are symmetrical in anterior view, but laterally they are slightly curved at the tip (figs. 24 and 25).

Several points of special interest are presented by *Scyphoproctus platyproctus*. One concerns the existence of a true segment between the peristomium and the first setiger. A frontal free-hand section was made on one of the paratypes, and observations were made on the ventral nerve cord in the anterior segments. It was seen that the circumesophageal connectives leave the nerve cord in the peristomial segment, and that all succeeding segments, including the achaetous segment immediately following the peristomium, possess a ganglion with segmental nerves arising from the ganglionic swellings of the nerve cord. Therefore, on the criterion that a true segment possesses a ganglion and segmental nerves, the achaetous segment is, indeed, a true segment. Gravier (1904, fig. 1), in his original description of the genus, presents a figure that clearly shows an achaetous segment between the peristomium and the first setiger. In his text (p. 558) Gravier states (*italics mine*): "Le premier segment, dorsalement plus développé que les autres, circonscrit, sur la face ventrale, l'orifice buccal par où sort une trompe globuleuse dont la surface n'est ornée d'aucune papille (fig. 1). Il ne porte ni appendices ni soies, *pas plus que le second segment*, dont les dimensions sont sensiblement les mêmes que celles des sétigères suivants. Les 12 segments suivants qui constituent le reste du thorax sont pourvus chacun de deux paires de faisceaux de soies toutes semblables entre elles." [The first segment, which is more developed dorsally than the others, ventrally surrounds the buccal orifice, through which a globose proboscis projects, the surface of which bears no papillae (fig. 1). It bears neither appendages nor setae, *nor does the second segment*, the dimensions of which are essentially the same as those of the following setigers. The next 12 segments which constitute the remainder of the thorax are each provided with two pairs of fascicles of setae, all of which are similar to one another."] Fauvel (1953, pp. 372-373), in describing specimens of *S. djiboutiensis* from India, has confirmed Gravier's observations. As the single specimen on which Okuda (1940) based his description of *S. gravieri* was a posterior fragment, the presence or absence of this achae-

tous segment in this species cannot be determined. Reish (1959) accompanies his description of *S. oculatus* with a figure of the anterior end of this California species, and the figure reveals that, in this case, either there is no achaetous segment or the specimens were sufficiently contracted that such a segment was difficult to observe. Therefore, it is felt that Hartman's diagrammatic representation of *Scyphoproctus* (1947a, pp. 402-403, chart I) might best be redrawn (fig. 26 of the present paper).

If the transverse slits of the thoracic region prove to be lateral organs, it will be the first case of such structures in the genus; the three previous descriptions report that they are lacking. Lateral organs that are protrusible from a lateral slit between notopodial and neuropodial setal bundles are not without precedent among the capitellid polychaetes, for, according to Hartman (1947a, p. 433), the lateral organs of *Dasybranchus lunulatus* Ehlers are of this type.

Hartman (1947a, p. 394), in her exhaustive and detailed study of the hooded hooks of various capitellids, presents a quotation by Eisig, with Hartman's interpolations, which states in part: " 'Die Haken . . . stellen sich in der Profilansicht als rundliche, in der Mitte leicht angeschwollene Stäbe dar [the shaft with node], deren Basis sichelförmig und deren freies Ende vogelkopffartig gekrümmt endet [the beak with major fang and crescent of teeth]; dem letzteren Ende sitzen überdies mehrere, meist drei, spitze Zinken auf, von denen der unterste [fang] der grösste zu sein pflegt. Untersucht man die Haken . . . auch in der Flächenansicht, so findet man, dass den erwähnten drei übereinander geordneten Zinken in Wirklichkeit drei Reihen [but see below] solcher entsprechen . . . Jede dieser Reihen enthält 7-10 Zinken, so dass deren in Ganzen etwa 20-30 vorhanden sein mögen [?]. ' " ("In profile, the hooks are seen as somewhat rounded shafts with slightly enlarged mid-regions [the shaft with node], the bases of which are sickle-shaped and the free ends of which terminate in a curved "bird's head" shape [the beak with major fang and crescent of teeth]; at the extreme tip, in addition, several, usually three, pointed teeth are mounted, of which the lowest [fang] is usually the largest. If one also examines the hooks in "frontal" view, then one finds that the three teeth mentioned above as arranged over one another, in reality correspond to three rows [but see below]. . . . Each of these rows include 7-10 teeth, so that it is possible that 20-30 teeth in all may be present [?]. ' ") The last two interpolations of Hartman are commented on later in her paper (p. 395): "Fundamentally, the structure of the hooks is as stated by Eisig. However, no instance has been found, among the hooded hooks examined, in which

there are actually several rows of teeth, with as many as 7 in each; in a few instances there is a tendency for the teeth in a single row to pile on one another (pl. 52, fig. 1); rarely they are in several rows (pl. 58, fig. 3). Most commonly they are in a single transverse row that may be slightly arched, or crescentic." While such may hold true for the species examined by Hartman, the present observations indicate that in the case of *Scyphoproctus* (not examined by Hartman), there are actually as many as four rows of teeth above the major tooth or fang (figs. 21-23 and 27). This condition is as readily observable under oil immersion with a conventional light source as with either dark-field or phase-contrast. It is apparent from the figures presented in the descriptions of the other three species of *Scyphoproctus* that the hooded hooks in these species have the same cockscomb appearance as the hooks of *S. platyproctus* (fig. 23). The only explanation for such a progression of teeth over the base of the fang is that there are several rows of teeth above the fang.

In spite of the variability of number of groups of acicular setae on the anal plaque of *S. platyproctus*, this character is perhaps the best by which to differentiate this species from *S. djiboutiensis* and *S. gravieri*, there being 11 in both of the latter species and five to seven in *S. platyproctus*. In addition, in *S. djiboutiensis*, the dorsalmost pair of setal groups forms a single continuous row of 16 acicular setae (cf. fig. 19), rather than being separated, as in the remaining species. Further, Gravier (1904) indicates that there is a pair of neuropodial fascicles of hooks associated with this dorsal row, which is also at variance with the other species. *Scyphoproctus platyproctus* can be differentiated from *S. oculatus* (Reish, 1959) by the lack of well-formed, elliptical-shaped eyes, and also by the number of acicular setae on the segments anterior to the anal plaque, there being one per group in *S. oculatus* and from two to seven in *S. platyproctus*. In addition, *S. platyproctus* differs from both *S. djiboutiensis* and *S. oculatus* in that the latter two species bear non-limbate capillary setae on the thoracic region, while those of *Scyphoproctus platyproctus* are bi-limbate. Finally, while Gravier describes the anal plaque as "un sorte de pavillon ou coupe allongée," Okudo and Reish consider it an "anal funnel," and the figures accompanying their descriptions all show the structure to be concave, the anal plaque of *Scyphoproctus platyproctus* is flattened, as its specific name implies.

As an aid in distinguishing the various species of *Scyphoproctus*, the following key is presented.



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